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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/471,460	12/22/1999	Thomas A Figura	94-0280.03	7429

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EXAMINER

LEE, CALVIN

ART UNIT PAPER NUMBER

2818

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/471,460	Applicant(s) FIGURA et al.	
	Examiner Lee, Calvin	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005 (RCE with Remark).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 45-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 45-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12/27/05. 6) ☐ Other: _____

OFFICE ACTION

Response to Amendment

1. The amendment of claim 48 and the addition of claims 50-56, received on December 27, 2005, are acknowledged.

Claim Rejections - 35 U.S.C. § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 48-49 are rejected under 35 U.S.C. 102(b) as being anticipated by *Marks et al*

a) *Marks et al* (US 5,204,288) discloses a method of providing a material **20a**, **20b** in a site between metal features **14**, **15** on a wafer **10** [Fig. 9], comprising the steps of:

-performing a deposition of the material on the wafer in a site [col. 9, ln.48];

-plasma etching the material [col. 7, ln.38] in the same general site used to perform the deposition, wherein the step of etching further comprises etching generally simultaneously with performing the deposition [col. 9, ln.50].

b) In re claim 49, *Mark et al* suggests performing a plasma deposition [col. 6, ln.61].

Claim Rejections - 35 U.S.C. § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 45-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kurosawa* (US 4,371,407) in view of *Marks et al*.

Kurosawa discloses a method of providing a material over a wafer, comprising of:

-performing a deposition of a material 4 in a site over the wafer 1 [Fig. 3B], wherein the step of performing a deposition further comprises depositing a polymer 5 on the wafer [Fig. 3C];
-plasma etching the oxide material 4 in the same general site used to perform the deposition of the oxide material [col. 6, ln.15], wherein the step of etching further comprises etching generally simultaneously with performing the deposition of the polymer [col. 6, ln.19].

a) In re claim 45, *Kurosawa* does not suggest, “deposition occurs at a greater rate within the site than above the features.” However, *Kurosawa* discloses, “a plasma polymer film is deposited at a rate of about 100Å/min ...”

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the deposition rate of *Kurosawa* by utilizing the claimed deposition rate because one would adjust any or all of such parameters as source power, flow rate, bias power to result in the most effective polymer deposition.

Kurosawa teaches providing the material over metal features 3 (reads on claim 47), but not in a site between metal features. Nevertheless, such material in a site between metal features is known in the semiconductor processing art as evidenced by *Marks et al* disclosing the same method of providing a material 20b in a site between metal features 14, 15 on a wafer 10 [Fig. 9].

It would have been obvious to one with ordinary skill in the art to modify the process of *Kurosawa* by utilizing a material in a site between metal features for the purpose of providing an etch resistance layer within the site being etched in a subsequent removal of the material, thereby avoiding an over-etch of the semiconductor material surrounding the site.

b) In re claims 50-51, *Kurosawa* in view of *Mark et al* teaches or suggests plasma etching a horizontal portion of the material on a surface of the wafer [Fig. 11 of *Mark et al*].

c) In re claim 52, none of the cited arts suggests flowing CF₄ at a rate of 25-200 sccm/min. Since the application disclosure suggests “the flow rate depends on which the feed gas is used, and can be determined by one of skill in the art from the description herein without undue experimentation,” it ‘s a matter of choice.

d) In re claim 53, none of the cited arts suggests the layer’s thickness. Te application disclosure suggests “These settings usually cause the etch resistant layer formed on the surface to be thinner than the material formed within the contact. It should be noted that there is an interaction between the listed parameters, and other settings in addition to the ranges listed above

may also function adequately. The setting here can be altered by one of ordinary skill in the art from the description herein to customize the etch resistant layer formation for various sizes and shapes of contact, and for various thicknesses within the contact and over the wafer surface. Depending on the application, any thickness of etch-resistant layer may be useful, but an etch-resistant layer 50Å or greater is preferred for most applications.” Again, it’s a matter of choice.

Response to Arguments

6. Applicant’s argument that “*Marks* fails to teach each and every element of claim 48” is unpersuasive. The Examiner notes that *Marks* [col. 9] teaches not only etching generally *simultaneously* with performing said deposition [col. 9, ln.51, “etch of the less dense silicon oxide sidewall of layer 20a will occur during the deposition”], but also *plasma* etching the material [col. 9, ln.48, “...with an etchant such as a fluorine species...”]. Moreover, *Marks* suggests, “the etch step may comprise any etch system... Preferably the dry etch will comprise a plasma etch using CHF₃ or CF₄ or argon” [col. 7, ln.38].

Applicant argued that *Kurosawa* does not suggest, “deposition occurs at a greater rate ...” The Examiner was aware the shortcoming of *Kurosawa*. However, the specification contains no disclosure of either the critical nature of the claimed greater rate of any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990). Furthermore, *Marks*’ disclosing “a plasma polymer film is deposited at a rate of about 100Å/min” suggests a rate reasonably similar or close to the claimed rate of deposition. A prima facie obviousness is established due to the expectation of similar results for similar ranges. See *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Applicant also argued that there is no reasonable expectation of success and there is no motivation to combine these references as they teach away from each other. As the Examiner is aware, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based on Applicant's disclosure. The Examiner did state in the last Office Action the factual inquiry whether to combine references must as thorough searching, and based on the objective evidence of record.


Contact Information

7. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 on Mondays thru Thursdays 6:30-4:30PM. If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2818's Supervisory Patent Examiner *David Nelms* can be reached at (571) 272-1787. The fax number for the organization is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAG or Public PAIR. For more information about the PAIR system, see <http://pair-direct.uspto.gov> Should you have questions on access to the PAG system, contact the Electronic Business Center (EBC) at 1-866-217-9197.



Dated: January 31, 2006



David Nelms
Supervisory Patent Examiner
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